Cumulative Index 1987

Volume 16

March	ATRIAL NATRIURETIC FACTOR (pages 1–228)
June	AUTOIMMUNE THYROID DISEASE (pages 229–473)
September	PITUITARY TUMORS: DIAGNOSIS AND MANAGEMENT (pages 475–828)
December	ENDOCRINOLOGY AND AGING (pages 829–1075)

Note: Page numbers of article and issue titles are in **boldface** type.

Abscess, pituitary, 631–632
Acromegaly, **685–703**
  clinical manifestations of, 690–694
    laboratory findings, 693–694
    local, 692–693
    systemic, 690–692
    radiography, 694
  diagnosis of, 694–696
    differential, 695–696
  follow-up and assessment of therapy, 698–700
  growth hormone and, 686–687
    regulation of, 685–686
  management of, 696–698
    of ectopic GRH/GH secretion, 698
    medical therapy, 697–698
    radiotherapy, 697
    surgery, 696–697
  pathogenesis of, 687–688
  pathology of pituitary adenomas, 688–689
  pathophysiology of, 689
  radiotherapy for, 672–674
  See also *Growth hormone-secreting tumors*.
ACTH. See *Adrenocorticotropin*.
Adenomas with mass effects, radiotherapy of, 677–679
Adenylate cyclase, 88
Adolescents, with Graves' disease, 383
Adrenal gland, and atrial natriuretic factor, 11, 67
  cortical function during aging, 967–971
beta-Adrenergic blocking agents, for Graves' disease, 381
Adrenergic modulation, of heart rate, 885–887
  of myocardial contractility, 882–885
  of vascular tonus, 879–882
Adrenocorticotropin (ACTH), and aging, 986
  in Cushing's disease, 716
  neuroendocrinology of regulation of, 494
Adrenocorticotropin-secreting tumors, 516–522
  ACTH secretory dynamics, 519–522
  CRH excess in Cushing's disease, 518–519
  hyperplasia of non-neoplastic corticotrophins, 519
  radiology of, 571
  tumor resection, and hypothalamic dysfunction, 522
Aging, calcium homeostasis and osteoporosis, **829–842**
  catecholamines and cardiovascular function in, **877–890**
  definition of terms, 949
  and diabetes mellitus, non-insulin-dependent, **843–865**
  endocrinology of, issue on, **829–1059**
  female, sex hormones in, **1027–1043**
  and gonadotroph cell pituitary adenomas, 757
  immune system, signal transduction mechanisms, **919–945**

Aging (*Continued*)
and insulin-like growth factors, **995–1011**
membrane receptor interactions, **947–963**
neurotransmitter function in, **893–917**
and pituitary hormones, **981–994**
stress and glucocorticoids, **965–980**
and testicular function, **1045–1059**
thyroid diseases, **1013–1025**
and water excretion, **867–875**
Aldosterone, and atrial natriuretic factor, 11, **123–136**, 173–174, 216–217
second messenger role, 95–96
Amino acids, in atrial natriuretic factor. See *Atrial natriuretic factor.*
Amiodarone, and thyroid function, 332–333
Androgens, and atrial natriuretic factor, 97
Aneurysms, differential diagnosis of, 629–631
radiology of, 575
Angiography, of pituitary adenomas, 563
Angiotensin, effects of atrial natriuretic factor, **123–136**, 216–217
Animal models of aging, insulin-like growth factors, 1006–1007
ovarian function, 1032–1033, 1034–1036
of thyroid cell MHC class II antigens, 254
thyroid diseases, 1015–1016
thyroid hormone action, 1022
thyroid-stimulating hormone responses, 1019
Antibodies, affinity-purification, 461
monoclonal, 458
polyclonal, 458
Antidiuretic hormone, and atrial natriuretic factor, 217
Antigens, in autoimmune thyroid disease, 308–310
intrathyroidal MHC class II, **247–268**
function of, 250–251
antigen processing and presentation, 250
autologous lymphocyte reactivity, 250
differentiation antigens, 251
postpresentation cascade, 250–251
HLA-D, 247–249
gene associations in humans, 249
gene mapping of, 249
heterogeneity of, 249
location and structure, 247–249
nonthyroid DR, T-cell autoreactivity to, 297
presentation in autoimmune thyroid disease, 308–310
thyroid, cloning of, 449–452, 462–466
thyrotropin receptor-related, 418–420
Antithyroid drugs, and cellular mechanisms, 310–312
in Graves' disease, 365–373
dosage and duration of therapy, 370–372
iodine effects on, 372–373
patient selection, 368–370
remission after, 373
Apoplexy, pituitary, 573–574
Arginine vasopressin (AVP), 868
Ascites, atrial natriuretic factor in, 218
hemodynamics in, 215
Atrial natriuretic factor, action of, 13, 122–123
binding sites for. See *Atrial natriuretic factor receptors.*
biologic properties, 7–14
in brain, immunohistochemistry of, 149–151
molecular forms of, 149
radioimmunoassay of, 146–149
"carba" analog, 23
circulating forms of, 183–186
classification of, 52–53
conformational properties of, 35–38
in congestive heart failure, 135
effects of, on aldosterone, 11, 129–130, 173–174, 216–217
and androgen synthesis, 97
on angiotensin, **123–136**, 216–217
on antidiuretic hormone, 217
on calcium flux, 13, 88–91
on cardiovascular system, 164–170
See also *Hemodynamics.*
on catecholamine release, 217–218
on central nervous system, 96–97, 132–133, 145–161
of dietary sodium, 134–135
dose-related, 164–165
on hemodynamics. See *Hemodynamics.*
on hypertension. See *Hypertension.*
on intestine, 10–11, 98
on kidney. See *Kidney.*
on lung, 97–98
negative inotropic, 167
on oxytocin, 155
pharmacologic, **163–182**
on phosphoinositide metabolism, 88–89
on progesterone synthesis, 11–12, 97, 131
on renin, 8–9, 96, 174–175, 216–217
on renin-angiotensin-aldosterone system, **123–136**
second messenger role in, 79–105
species differences, 175–176
on steroidogenesis, 11–12, 129–131
on testosterone, 97, 131, 175
on vasopressin, 152–155, 175
high molecular weight (atriopeptigen), 5
human, identification of, 43–47
human studies with, **199–223**
levels of, in cardiac arrhythmia, 203
in cardiac failure, 201
versus dietary sodium, 201
in hypertension, 203–205, 208–210

in pregnancy, 201
in volume overload, 201
normal, 200
low molecular weight (atriopeptins), 3–5
molecular biology of, **43–58**
monoclonal antibodies to, 134
precursors of, amino acid sequences, 51–53
cloning of, 48–53
gene expression in, 57–58
gene structure of, 53–57
structure of, 48–53
prohormone of, 6–7
purification of, 2–3
radioimmunoassay of, **186–194**
application of, 191–193
in brain, 146–149
procedures for, 186–191
radiolabeled, 186–188
in rat, 20–22, 47–48
selenium analog, 25–26
structure of, 1–7, 184–186
structure-activity relationships, **30–38**
synthesis of, **19–30**
therapeutic use of, 219
volume regulation by, 134–135
Atrial natriuretic factor analogs, 30–38
Atrial natriuretic factor receptors, **63–77**, 84–87
in adrenal gland, 67
adenylate cyclase inhibition by, 88
amino acid sequences, 74–75
in brain, 151–152
in central nervous system, 68
characterization of, 66–67
in endothelial cells, 73
in eye, 68
in heart, 68
in kidney, 67–68, 118–123
molecular cross-linking of, 69–73
molecular weight of, 69
monoclonal antibodies to, 74
purification of, 74, 83–84
second messenger effects of, **79–105**
in smooth muscle, 73
structure of, 74–75
unlinked form, 74
in vascular system, 66
Atriopeptigen, 5
Atriopeptins, 3–5, 12
Autoantibodies, **343–363**
to thyrotropin receptor, 346–356
mechanisms for TRAb production, 357–359
nomenclature, 346
thyroid growth-stimulating IgG, 356
TRAb assays, 346–349
cytochemical assays, 348
FRTL5 cell stimulation, 348
thyroid cell stimulation in monolayer cultures, 346–348
TSH receptor binding, inhibition of, 348–349
TRAb multiplicity of, in autoimmune thyroid disease, 352–356
TRAb prevalence in autoimmune thyroid disease, 349–352
in euthyroid relatives of Graves' disease patients, 351–352
in Graves' disease, 349–350
in nonautoimmune thyroid disorders, 350–351
Autoimmunity, of thyroid, and MHC class II antigen expression, **247–268**
Axial computed tomographic scanning, 561–562

Behavior, aging female, 1037–1038
Blood vessels, effects of atrial natriuretic factor, 9–10, 131–132, 164–170
Bone loss, model for, 838–839
turnover, age effects, 832–834
Bone marrow, MHC class II antigen expression in, 251–252
Brain, atrial natriuretic factor in, 132–133, **145–161**
second messenger role, 96–97
atrial natriuretic factor receptors in, 68, 151–152
immunohistochemistry, 149–151

Calcification, of pituitary adenomas, 573
Calcitonin, 837
Calcium, atrial natriuretic factor effects, 88–91
atriopeptin-induced vasorelaxation and, 13
homeostasis and osteoporosis, **829–842**
bone turnover, age effects, 832–834
calciotropic hormones, 834–838
calcitonin, 837
growth hormone, 838
parathyroid hormone, 835–836
vitamin D-endocrine system, 836–837
mobilization, aging immune system, 924–926
model for age-related bone loss, 838–839
Calmodulin calcium complex, 927–928
Cancer, and radioiodine treatment for Graves' disease, 378
thyroid, 1014–1016
Carcinoid tumors, and ectopic somatostatin hypersecretion, 813
Cardiac, abnormalities in Graves' disease, 383
arrhythmia and failure, atrial natriuretic factor levels, 201

Cardiac *(Continued)*
output, reduction of by atrial natriuretic factor, 168–169
Cardiovascular function, atrial natriuretic factor effects, 164–170
See also *Catecholamines and cardiovascular function: Hemodynamics.*
Cascade, postpresentation, of class II antigens, 250–251
Catecholamines, atrial natriuretic factor effects, 217–218
and cardiovascular function, **877–890**
adrenergic modulation, 879–887
of heart rate, 885–887
of myocardial contractility, 882–885
of vascular tonus, 879–882
cellular mechanisms of altered beta-adrenergic responsiveness, 887–889
determinants of, 879
Cation flux, monovalent, 929–931
Cavernous sinus, computed tomography of, 559–560
Cell-mediated cytotoxicity, in autoimmune thyroid disease, 272–273
immunity, in endocrine ophthalmopathy, 312–315
HLA-DR expression, 314–315
T-cell dysfunction, 313–314
Central nervous system, and atrial natriuretic factor, 132–133, **145–161**
second messenger role, 96–97
immunohistochemistry of, 149–151
molecular forms of, 149
radioimmunoassay of, 146–149
receptors in, 68, 151–152
Chiasm, and visual field defects, 593–603
anterior angle and nerve compression, 598
compression of body, 593–598
posterior angle and tract compression, 598–603
Children, with Graves' disease, 383
Chloramine T method, in atrial natriuretic factor iodination, 186–187
Chordoma, differential diagnosis of, 619–621
Cloning of atrial natriuretic peptide precursors, 48–53
Complement, and antibody-dependent cytotoxicity, 271
Compliance to diet and exercise, in diabetes mellitus, 859
Computed tomography, of pituitary adenomas, 554–561
cavernous sinus, 559–560
gland density, 555–556
gland height, 556–559
infundibulum, 559
sellar floor and subsellar structures, 561
superior surface of gland, 559
suprasellar structures, 560
vascular structures, 555
Congenital hypothyroidism, 423–424
Congestive heart failure, and atrial natriuretic factor, 135, 192
Coronary arteries, and atrial natriuretic factor, 167
Corticosteroids, for thyroid-associated ophthalmopathy, 398–399
Corticotropin-releasing factor, in Cushing's disease, 518–522, 717
hypersecretion, extrahypothalamic, 808–809
hypothalamic, aging effects, 901–902
Coupling systems, and membrane receptors, 955–956
Craniopharyngiomas, 576
differential diagnosis of, 614–616
Craniotomy, 659–660
Cushing's disease, **705–730**
clinical features of, 709–712
diagnosis of, 712–720
ACTH plasma levels, 716
corticotropin-releasing hormone, 717
dexamethasone suppression testing, 716
differential, 715–720
hypercortisolemia, 712–714
metyrapone testing, 718
petrosal sinus ACTH sampling, 716–717
problems in, 714–715
radiology of, 718–720
etiology and pathogenesis of, 707–709
laboratory findings, 712
and Nelson's syndrome, 724–725
pathology of, 705–706
pathophysiology of, 706–707
problems in determining cause, 720–721
therapy, medical, 723–724
radiotherapy, 674–675, 722–723
surgical, 721–722
See also *Adrenocorticotropin-secreting tumors.*
Cyclic adenosine monophosphate, messenger systems, 931–933
Cyclic guanosine monophosphate (cGMP), atrial natriuretic factor receptors and, 13, 69, **79–105**
excretion of, atrial natriuretic factor effects, 94
messenger systems, aging effects, 931–933
and smooth muscle contractility, 89–91
Cyclonatrin-54, 25–26
Cyclosporine, for thyroid-associated ophthalmopathy, 399
Cysts, arachnoid, 619
Rathke's cleft, 618
suprasellar and intrasellar, 617–618
Cytotoxic mechanisms, **269–286**
in experimental autoimmune thyroiditis, 270–271
in Graves' ophthalmopathy, 276–280
in human autoimmune thyroid disease, 271–276

antibody-dependent cell-mediated, 272
antibody-dependent complement-mediated, 271
immune complexes, 272
monokines and lymphokines, 276
natural killer cell-mediated, 272–273
T lymphocyte role, 273–276

Dermoid and epidermoid tumors, 623
Dexamethasone suppression testing, 716
Diabetes mellitus, non-insulin-dependent, **843–865**
clinical problems in elderly, 843–845
complications, 852–855
diet and exercise in treatment of, 855–859
compliance, 859
drug therapy, 859–861
obesity and physical inactivity, role of, 848–852
prevalence and diagnosis, 846–848
Diet, and non-insulin-dependent diabetes mellitus, 855–859
compliance, 859
DNA. See *Recombinant DNA technology.*
Dopamine system in hypothalamus, 894–896
Drug therapy, for non-insulin-dependent diabetes mellitus, 859–861

Ectopic pituitary and hypothalamic hormone syndromes, **805–821**
diagnostic criteria, 806
ectopic pituitary hormone hypersecretion, 813–814
hypothalamic peptide production, 807–813
corticotropin-releasing factor hypersecretion, 808–809
GRH hypersecretion, 809–812
hypothalamic GnRH-secreting hamartomas, 807–808
somatostatin hypersecretion, 812–813
Empty sella syndrome, 574
differential diagnosis of, 636–638
Endocrinology issues, aging, **829–1059**
atrial natriuretic factor, **1–228**
autoimmune thyroid disease, **229–468**
pituitary tumors, **475–821**
Endothelium, atrial natriuretic factor receptors in, 73, 84–87
cyclic GMP action on, 82
Environmental factors in autoimmune thyroid disease, **327–342**
amiodarone effects, 332–333
environmental pollutants, 335–336
epidemiology, 327–329
infectious agents, 334–335
iodine effects, 329–332
lithium effects, 333–334
stress, 336–337
Epidemiology, and environmental factors in autoimmune thyroid disease, 327–329
Epithelium, effects of atrial natriuretic factor, 114
Estrous cycle, 1028–1029
Euthyroidism, and thyrotropin tumors, 783
Exercise, and non-insulin-dependent diabetes mellitus, 855–859
compliance, 859
Eye, atrial natriuretic factor receptors in, 68

Female, aging. See *Sex hormones, in aging female.*
Follicle-stimulating hormone, neuroendocrinology of, 496–497
FRTL5 cells, in TRAb assays, 346–349

Gamma-interferon, 298–299
Gene cloning, with antibody probe, 456–462
antibody affinity-purification, 461
antibody detection systems, 458–459
lambda gt11 system, 461–462
library screening, 458
mRNA hybridization, 460
Northern blot analysis, 460
with oligonucleotide probe, 452–456
Gene transcription, of thyroid MHC class II antigens, 254–256
Genes, in atrial natriuretic peptide precursors, 57–58
structure of, 53–57
Genetics, regulation of thyroid autoantigen expression, 452
risks of radioiodine treatment, 378
See also *Immunogenetics.*
Germinoma, suprasellar, 621–623
Giant cell granuloma, 633
Glomerular filtration rate, effects of atrial natriuretic factor, 7–8, 93, 108–109, 116–117, 121–122
Glucocorticoids, and atrial natriuretic factor, 130–131
for Graves' disease, 382
See also *Stress and glucocorticoids in aging.*
Glycoprotein hormone subunits, 989
Goiter, multinodular, 1014–1016
Gonadotroph cell pituitary adenomas, **755–764**
clinical characteristics, 756–757
age, 757,
gonadal function, 757
sex, 757
size, 757
etiology of, 760–762

Gonadotroph cell pituitary adenomas *(Continued)*
hormonal characteristics in vivo, 757–760
hormonal hypersecretion, 757–758
secondary hypogonadism, 758–760
TRH effects, 758
incidence of, 755–756
normal cell function, 755
therapy of, 762–763
Gonadotropins, and aging, 987–989
Graves' disease, **365–389**
antithyroid drugs for, 365–373
general considerations, 365–368
treatment strategy, 368–373
dosage and duration of therapy, 370–372
iodine effects on, 372–373
patient selection, 368–370
remission after, 373
beta-adrenergic blocking agents for, 381
cardiac abnormalities in, 383
in children and adolescents, 383
euthyroid relatives of, 351–352
glucocorticoid treatment, 382
immunogenetics of, 232–235, 237–238
interaction between genetic markers in, 240–242
iodine treatment, 381
ipodate sodium treatment, 381
lithium carbonate treatment, 381–382
and ophthalmopathy, 383
and pregnancy, 433–435
radioactive iodine treatment, 374–378
acute complications of, 378
cancer and genetic risks of, 378
dose of radioactivity, 374–376
general considerations, 374
patient characteristics, 376–377
subtotal thyroidectomy, 378–381
complications of, 379–380
general considerations, 378–379
preparation for surgery, 379
thyroid function after, 380–381
thyrotoxic crisis in, 382
thyrotoxicosis and iodine contamination in, 383
TRAb prevalence in, 349–350
Graves' hyperthyroidism. See *Graves' disease.*
Growth factors. See *Insulin-like growth factors.*
Growth hormone, actions of, 686–687
and aging, 984–986
calcium homeostasis and osteoporosis, 838
hypothalamic peptide regulation of, 902–906
and insulin-like growth factors, 1003–1006
neuroendocrinology of regulation of, 494–495
regulation of secretion, 685–686
Growth hormone-releasing hormone (GRH), in acromegaly, 505–506, 509–512
ectopic secretion, therapy of, 698
hypersecretion, ectopic, 811–812
extrahypothalamic, 810–811
hypothalamic, 809–810
Growth hormone-secreting tumors, 505–513, 571–573
ectopic, 813–814
GRH excess in, 505–506
hyperplasia of non-neoplastic somatotrophs, 506–509
pathology of, 688–689
secretory dynamics of, 509–512
tumor resection, and hypothalamic dysfunction, 512
lambda-gt11 system, in recombinant DNA technology, 461–462
Guanylate cyclase, action of, 80–87
and atrial natriuretic factor receptor, 13, 69, **79–105**
isozymes of, 80, 82
particulate versus soluble, 82–83
purification of, 83–84

Hamartomas, hypothalamic GnRH-secreting, 807–808
Hashimoto's thyroiditis, hypothyroidism in, 420
immunogenetics of, 240–241
and pregnancy, 436–437
Heart, atrial natriuretic factor receptors, 68
Heart failure, atrial natriuretic factor in, 172–173, 210, 218
congestive, 135, 192
hemodynamics in, 215
left ventricular, 170
Heart rate, adrenergic modulation of, 885–887
atrial natriuretic factor effects, 210–213
Helper/suppressor T lymphocytes, 301–308
antigen-specific abnormalities, 304–308
nonspecific T-cell abnormalities, 301–304
Hemodynamics, atrial natriuretic factor effects, renal, 8, 119–122, 127–128
systemic, 132, 210–215
Histocytosis C, 633–634
HLA-D antigens, gene associations in humans, 249
gene location, 249
heterogeneity of, 249
immunologic privilege of, 253
location and structure of, 247–249
nonclassical expression of, 252–253
HLA-DR antigens, in endocrine ophthalmopathy, 314–315
expression on T-cell surfaces, 296–297

Hormones, calciotropic, and aging, 834–838
receptors, bioactivity of, 64–65
identification of, 65–66
See also specific hormones.
Hypercortisolemia, in Cushing's disease, 712–714
Hyperprolactinemia, causes of, 731–733
Hypertension, atrial natriuretic factor in, 169–170, 172, 191–193, 217–218
hemodynamic effects of, 213–215
levels in, 203–205, 208–210
Hyperthyroidism, 1020–1022
clinical features, 1020–1021
experimental studies, 1022
Graves'. See *Graves' disease.*
laboratory tests, 1021
treatment, 1021–1022
See also *Thyrotropin-secreting pituitary tumors.*
Hypogonadism, secondary, in gonadotroph cell adenomas, 758–760
Hypotension, and atrial natriuretic factor, 167–169, 210–213
Hypothalamus, and atrial natriuretic factor, 12, 157–158
corticotropin-releasing factor, 901–902
dopaminergic neurons, 894–896
dysfunction, in acromegaly, 512
in Cushing's disease, 522
in prolactinomas, 513–516
gliomas of, 576–578, 624
luteinizing hormone-releasing hormone neurons, 899–901
neuroendocrinology of hormone regulation, **475–501**
anatomy of, 478–481
hypothalamic neurohypophyseal tract, 485–489
median eminence, 481–485
tuberoinfundibular system, 489–492
neurohypophyseal tract, 485–489
noradrenergic neurons, 896
peptides in growth hormone regulation, 902–906
proopiomalanocortin-derived peptides and opioid peptides, 898–899
serotoninergic neurons, 897–898
and testicular axis, 1047–1052
normal physiology of, 1047–1048
pituitary/hypothalamic function, 1051–1052
sex steroid changes with age, 1048–1050
thyrotropin regulation, 906–908
See also *Ectopic pituitary and hypothalamic hormone syndromes.*
Hypothyroidism, 1016–1019
clinical features, 1016–1017
experimental studies, 1019
immunologically mediated, **417–429**
antibodies to thyrotropin-receptor antigens, 418–420
chronic thyroiditis (Hashimoto's thyroiditis), 420
congenital, 242, 423–424
humoral immunity in autoimmune thyroid diseases, 418
postpartum, 422–423
transient thyroiditis, 420–422
thyroid hormone determinations, 1017
thyroid-stimulating hormone determinations, 1017–1018
treatment, 1018–1019
See also *Thyrotropin-secreting pituitary tumors.*

Idiotypes, cross-reactive, in autoimmune thyroid disease, 239
Immune complexes, in autoimmune thyroid disease, 272
Immune system, signal transduction mechanisms, **919–945**
calcium mobilization, 924–926
calmodulin calcium complex, 927–928
cAMP and cGMP messenger systems, 931–933
monovalent cation flux, and membrane potential changes, 929–931
phosphoinositide-derived second messengers, 921–924
phospholipase C activation, 920–921
prostanoids, 933–935
protein-tyrosine kinase activation, 935–936
proto-oncogene products, 936–938
sodium/hydrogen antiport activation, 928–929
Immunocytochemistry, of nonsecreting pituitary tumors, 795–797
Immunogenetics of autoimmune thyroid disease, **229–245**
cross-reactive idiotypes, 239
Graves' disease, 232–235
genetics of, 237–238
interaction between genetic markers in, 240–242
immunoglobulin heavy chain markers, 238–239
major histocompatibility complex, 230–232
phenylthiourea tasting, 238
T-cell receptor, 239–240
thyroid-associated ophthalmopathy, 235–237
Immunoglobulins, heavy chain markers, 238–239
thyroid growth-stimulating IgG, 356

Immunohistochemistry of brain atrial natriuretic factor, 149–151
Immunoreactivity, of brain atrial natriuretic factor, 145–152
Immunotherapy, for thyroid-associated ophthalmopathy, 398–400, 402–403
Impotence, 1054
Infections, and autoimmune thyroid disease, 334–335
Infundibulum, computed tomography of, 559
Inotropic effects, of atrial natriuretic factor, 167
Insulin, atrial natriuretic factor effects, 218
Insulin-like growth factors, **995–1011**
  age effects, and growth hormone secretion, 1003–1006
  in animal models of aging, 1006–1007
  in circulation, measurements of, 999
  in human development and aging, 999–1003
Interleukin-2, in autoimmune thyroid disease, 299–300
Intestine, atrial natriuretic factor effects, 10–11, 98
Iodine, and atrial natriuretic factor, 186–187
  and antithyroid drug efficiency, 372–373, 381
  and course of autoimmune thyroid disease, 330–332
  and incidence of autoimmune thyroid disease, 329–330
  radioactive, in Graves' disease, 374–378
    acute complications of, 378
    associated medications, 377
    cancer and genetic risks of, 378
    dose of radioactivity, 374–376
    patient characteristics, 376–377
Ipodate sodium, 381

Juxtaglomerular cells, and atrial natriuretic factor, 128–129

Kidney, atrial natriuretic factor receptors in, 67–68, 93
  distribution of, 118–119
  effects of atrial natriuretic factor, 7–9, **107–143**, 170–173
    in failure, 172
    in healthy volunteers, 206–208
    second messenger role in, 92–94
  and eutopic somatostatin hypersecretion, 813
  renal collecting tubule response to AVP, 869–870

Lactoperoxidase, in atrial natriuretic factor iodination, 187
Leydig cells, effects of atrial natriuretic factor, 11–12
Lithium, and autoimmune thyroid disease, 333–334
  for Graves' disease, 381–382
Lung, atrial natriuretic factor effects, 10
  second messenger role, 97–98
Luteinizing hormone neuroendocrinology, 496–497
Luteinizing hormone-releasing hormone, 899–901
Lymphocytes, autologous reactivity of, 250
Lymphocytic hypophysitis, 634–635
Lymphocytic thyroiditis, 1013–1014
Lymphokines, in autoimmune thyroid disease, 276, 297–300
  gamma-interferon, 298–299
  interleukin-2, 299–300
  migration inhibiting factor, 298

Magnetic resonance imaging, of pituitary adenomas, 562–563
Major histocompatibility complex (MHC), and cytotoxic T lymphocytes, 275–276
  immunogenetics of, 230–232
  intrathyroidal class II antigen expression of, **247–268**
    and disease susceptibility, 263–265
    expression outside immune system, 251–253
    function of, 250–251
    HLA-D antigens, 247–249
    role of in humans, 260–263
    in thyroid cells, 254–260
Median eminence, 481–485
Medullary wash-out, and atrial natriuretic factor, 117, 122
Membrane potential, and monovalent cation flux, 929–931
Membrane receptor interactions. See *Receptors, age-related changes.*
Meningioma, parasellar, 624–625
Menstrual cycle, and menopause, 1027–1028
Metastases, and pituitary adenomas, 578–579, 626
Metrizamide computed tomographic cisternography, 562
Metyrapone testing, 718
Microsomes, thyroid antigen, 462–466
Migration inhibition factor, 298
Monokines, in autoimmune thyroid disease, 276

Muscles, extraocular, in thyroid-associated ophthalmopathy, 394
smooth, atrial natriuretic factor receptors in, 73, 84, 86
cyclic GMP action on, 82
effects of atrial natriuretic factor, 9–11
Myocardium, contractility of, 882–885

Natriuresis. See *Atrial natriuretic factor.*
Natural killer cells, and autoimmune thyroid disease, 272–273
Nelson's syndrome, and Cushing's disease, 724–725
radiotherapy for, 675
Nervous system, atrial natriuretic factor effects, 12–13
and eutopic somatostatin hypersecretion, 812
Neuro-ophthalmology of pituitary tumors, **585–608**
anatomy, 585–587
pathophysiology of vision loss, 606–607
symptoms and signs, 587–590
clinical findings, 590
vision loss patterns, 588–590
visual field defects, 591–605
causes of, 593–603
detection of, 604
recovery of vision after treatment, 605
Neuroendocrinology of pituitary hormone regulation, **475–501**
anterior pituitary regulation, 492–497
adrenocorticotropin, 494
growth hormone, 494–495
luteinizing hormone/follicle-stimulating hormone, 496–497
prolactin, 495–496
thyroid-stimulating hormone, 492–494
hypothalamus, gross, microscopic, and radiologic anatomy, 478–481
hypothalamic neurohypophyseal tract, 485–489
tuberoinfundibular system, 489–492
pituitary gland, gross, microscopic, and radiologic anatomy, 475–478
vascular supply, 478
Neurotransmitter function, aging effects, **893–917**
hypothalamic, corticotropin-releasing factor, 901–902
dopaminergic neurons, 894–896
luteinizing hormone-releasing hormone neurons, 899–901
noradrenergic neurons, 896
peptides and growth hormone regulation, 902–906
proopiomalanocortin-derived peptides and opioid peptides, 898–899
serotoninergic neurons, 897–898
peptides in thyrotropin regulation, 906–908
Nodules, thyroid, 1014–1016
Noradrenaline, atrial natriuretic factor effects, 217
Noradrenergic neurons, in hypothalamus, 896
Northern blot analysis, 460

Obesity, and non-insulin-dependent diabetes mellitus, **843–865**
Oligonucleotide probe, gene cloning with, 452–456
Ophthalmopathy, thyroid-associated, **391–407**
cell-mediated immunity in, 312–315
HLA-DR expression, 314–315
T-cell dysfunction, 313–314
cytotoxic mechanisms in, 276–280
in Graves' disease, 383
immunogenetics of, 235–237
immunotherapy for, 402–403
pathogenesis of, 391–393
treatment, aims and assessment of, 393–395
local measures, 396
orbital radiotherapy, 396–398
pharmacologic immunotherapy, 398–400
surgical, 400–402
thyroid ablation, 400
Opioid peptides, 898–899
Optic nerve, gliomas, 623–624
in thyroid-associated ophthalmopathy, 394
Orbital radiotherapy, 396–398
Osmolar clearance, 872–873
Osmoreceptor sensitivity, 868–869
Osteoporosis. See *Calcium homeostasis and osteoporosis.*
Ovary, in aging animals, 1032–1033
steroidogenic function, 1030–1032
Oxytocin, atrial natriuretic factor effects, 155

Pancreas, and eutopic somatostatin hypersecretion, 812
Parathyroid hormone, calcium homeostasis and osteoporosis, 835–836
Peptides, atrial natriuretic. See *Atrial natriuretic factor.*
hypothalamic, and growth hormone regulation, 902–906
opioid, 898–899
proopiomelanocortin-derived, 898–899
and thyrotropin regulation, 906–908
Petrosal sinus ACTH sampling, 716–717

Phenotypic lymphocyte analysis, 288–294
circulating lymphocyte studies, 288–292
killer T cells, 291–292
T-cell subset analysis, 289–290
thyrotoxicosis and T-cell numbers, 290–291
intrathyroidal lymphocytes studies, 292–294
Phenylthiourea tasting, in autoimmune thyroid disease, 238
Pheochromocytoma, and ectopic somatostatin hypersecretion, 813
Phosphoinositide metabolism, atrial natriuretic factor effects, 88–89
Phospholipase C activation, 920–921
Physical inactivity, and non-insulin-dependent diabetes mellitus, **843–865**
Pituitary gland, and hypothalamic function, 1051–1052
neuroendocrinology of hormone regulation, **475–501**
anatomy of, 475–478
vascular supply of, 478
Pituitary hormones, and aging, **981–994**
anterior, 983–989
adrenocorticotropin, 986
glycoprotein hormone subunits, 989
gonadotropins, 987–989
growth hormone, 984–986
prolactin, 984
thyrotropin, 986–987
atrial natriuretic factor effects, 96, 157–158
posterior, 982–983
Pituitary tumors, differential diagnosis of, **609–645**
aneurysms, 629–631
empty sella, 636–638
granulomatous and infectious diseases, 632–635
giant cell granuloma, 633
histocytosis X, 633–634
lymphocytic hypophysitis, 634–635
sarcoid, 632–633
tuberculosis, 632
miscellaneous tumors, 626–628
nonpituitary lesions, parasellar and intrasellar, radiology of, 612–614
symptoms and signs, 609–612
parasellar lesions, 614–626
arachnoid cyst, 619
chordoma, 619–621
craniopharyngioma, 614–616
dermoid and epidermoid tumors, 623
hypothalamic glomas, 624
optic nerve gliomas, 623–624
parasellar meningioma, 624–625
pituitary metastases, 626
Rathke's cleft cyst, 618
suprasellar germinoma, 621–623
suprasellar and intrasellar cysts, 617–618
pituitary abscess, 631–632
sphenoid sinus mucoceles, 635–636
gonadotroph cell adenomas, **755–764**
clinical characteristics, 756–757
etiology of, 760–762
hormonal characteristics in vivo, 757–760
incidence of, 755–756
normal gonadotroph cell function, 755
therapy, 762–763
neuro-ophthalmology of, **585–608**
anatomy, 585–587
pathophysiology of visual loss, 605–607
symptoms and signs, 587–590
clinical findings, 590
vision loss patterns, 588–590
visual field defects, 591–605
causes of, 594–603
detection of, 604–605
recovery after treatment, 605
nonsecreting, **793–804**
characterization in vitro, 794–798
hormone secretion, 797–798
immunocytochemistry, 795–797
and endocrine function, 794
management of, 799–800
pituitary function after, 800–802
pathogenesis of, **503–527**
adrenocorticotropin-secreting tumors, 516–522
CRH excess in Cushing's disease, 518–519
non-neoplastic corticotroph hyperplasia, 519
secretory dynamics, 519–522
growth hormone-secreting tumors, 505–513
excess GRH in acromegaly, 505–506
non-neoplastic somatotroph hyperplasia in acromegaly, 506–509
secretory dynamics in acromegaly, 509–512
tumor resection, and hypothalamic dysfunction, 512
prolactin-secreting tumors, 513–516
hyperplasia of non-neoplastic lactotrophs, 513
prolactinoma resection, and hypothalamic dysfunction, 516
secretory dynamics, 513–516
pathology of, **529–551**
adenoma types, 533–542
classification, 530–533
definition and frequency, 529–530
hyperplasia in, 542–545
pathogenesis of, 545–547
radiology of, **553–584**
adenoma pathology, 563–574

ACTH-producing tumors, 571
calcifications in, 573
empty sella, 574
growth-hormone-producing tumors, 571–573
pituitary apoplexy, 573–574
predictive factors in management, 573
prolactinomas, 564–571
angiography, 563
axial computed tomographic scanning, 561–562
computed tomography, high-detail, direct-coronal, 554–561
cavernous sinus, 559–560
gland density, 555–556
gland height, 556–559
infundibulum, 559
sellar floor and subsellar structures, 561
superior surface of gland, 559
suprasellar structures, 560
vascular structures, 555
differential diagnosis, 574–580
aneurysms, 575
craniopharyniomas, 576
hypothalamic gliomas, 576–578
metastases, 578–579
other lesions, 580
tuberculum sellae meningiomas, 576
magnetic resonance imaging, 562–563
metrizamide computed tomographic cisternography, 562
radiotherapy of, **667–684**
for acromegaly, 672–674
for adenomas with mass effects, 677–679
complications of, 679–680
for Cushing's disease, 674–675
general comments, 668
for Nelson's disease, 675
patient evaluation for, 667–668
for prolactin-secreting adenomas, 675–677
results, 672
techniques of, 668–672
surgery of, **647–665**
adjunctive therapy, 662–663
approach in, 650–660
craniotomy, 659–660
transsphenoidal, 651–659
history of, 647–648
indications for, 648–749
preoperative evaluation and management, 650
results of, 660–662
thyrotropin-secreting, **765–791**
and euthyroidism, 783
and hyperthyroidism, 772–782
clinical features, 772–773
differential diagnosis, 780–781
dynamic studies, 777–780
laboratory studies, 773–775
pathology, 780
radiography of, 775–777
therapy, 781–782
and hypothyroidism, 767–772
clinical features, 768–769
laboratory studies, 769–770
therapy, 770–772
thyrotropin secretion, regulation of, 765–767
See also *Ectopic pituitary and hypothalamic hormone syndromes.*
Plasmapheresis, in thyroid-associated ophthalmopathy, 399–400
Pollutants, environmental, and autoimmune thyroid disease, 335–336
Postpartum, hypothyroidism, 422–423
thyroiditis syndrome, 241, 438–441
Pre-atrial natriuretic peptides. See *Atrial natriuretic factor.*
Pregnancy, atrial natriuretic factor levels in, 201
and autoimmune thyroid disease, **431–444**
Graves' disease, 433–435
Hashimoto's thyroiditis, 436–437
postpartum thyroiditis syndrome, 438–441
and prolactinoma treatment, 744–747
Pretibial myxedema, **409–415**
biopsy findings, 411–412
clinical findings in, 411
pathogenesis of, 409–411
treatment of, 412–413
Progesterone, atrial natriuretic factor in, 11–12, 131
second messenger role, 97
Prohormone, of atrial natriuretic factor, 6–7
Prolactin, and aging, 984, 1036–1037
ectopic secretion, 814
neuroendocrinology of regulation of, 495–496
Prolactin-secreting tumors. See *Prolactinomas.*
Prolactinomas, **731–753**
clinical manifestations, 733–735
evaluation of, anatomic, 736–738
biochemical, 735–736
of visual system, 738
hyperplasia of non-neoplastic lactotrophs, 513
prolactin secretory dynamics in, 513–516
radiology of, 564–571
macroprolactinomas, 567–569
medical management, 569–571
microprolactinomas, 564–567
radiotherapy for, 675–677
tumor resection, and hypothalamic dysfunction, 516

Prolactinomas *(Continued)*
hyperprolactinemia causes, 731–733
management of, 738–747
irradiation, 738–739
medical therapy, 740–744
during pregnancy, 744–747
trans-sphenoidal resection, 739–740
Proopiomalanocortin-derived peptides, 898–899
Proptosis, in thyroid-associated ophthalmopathy, 394
Prostanoids, 933–935
Protein A, antibody detection system, 458
Protein-tyrosine kinase activation, 935–936
Proto-oncogene products, and signal transduction, 936–938

Radioimmunoassay for atrial natriuretic factor, **186–194**
applications of, 191–193
in brain, 146–149
procedures for, 186–191
Radiology of pituitary adenomas, **553–584**
of acromegaly, 694
adenoma pathology, 563–574
ACTH-producing tumors, 571
calcifications, 573
empty sella, 574
growth-hormone-producing tumors, 571–573
pituitary apoplexy, 573–574
predictive factors in management, 573
prolactinomas, 564–571
angiography, 563
axial computed tomographic scanning, 561–562
computed tomography, high-detail, direct-coronal, 554–561
cavernous sinus, 559–560
gland density, 555–556
gland height, 556–559
infundibulum, 559
sellar floor and subsellar structures, 561
superior surface of gland, 559
suprasellar structures, 560
vascular structures, 555
of Cushing's disease, **705–730**, 718–720
differential diagnosis, 574–580
aneurysms, 575
craniopharyngiomas, 576
hypothalamic gliomas, 576–578
metastases, 578–579
other lesions, 580
tuberculum sellae meningiomas, 576
of intrasellar and parasellar nonpituitary lesions, 612–614
magnetic resonance imaging, 562–563
metrizamide computed tomographic cisternography, 562
of thyrotropin tumors with hyperthyroidism, 775–777
Radiotherapy, of pituitary tumors, **667–684**
for acromegaly, 672–674, 697
for adenomas with mass effects, 677–679
complications of, 679–680
for Cushing's disease, 674–675, 722–723
for Nelson's syndrome, 675
patient evaluation, 667–678
for prolactinomas, 675–677, 738–739
results of, 672
techniques of, 668–672
Rathke's cleft cyst, 618
Receptors, age-related changes, **947–963**
binding studies, 950–951
and coupling systems, 955–956
definitions of aging terms, 949
density in membranes, 952
and extracellular environment, 952–953
future studies, 958–959
and membrane components, 957–958
second messenger pathways, 951–952, 956–957
subjects, 950
hormone, bioactivity of, 64–65
identification of, 65–66
See also *Atrial natriuretic factor receptors.*
T-cell, immunogenetics of, in autoimmune thyroid disease, 239–240
and transmitter interactions, 953–955
See also *Thyrotropin receptor autoantibodies.*
Recombinant DNA technology, and autoimmune thyroid disease, **445–468**
DNA libraries, 446–449
gene cloning, with antibody probe, 456–462
antibody affinity-purification, 461
antibody detection systems, 458–459
lambda gt 11 system, 461–462
library screening, 458
mRNA hybridization, 460
Northern blot analysis, 460
gene cloning, with oligonucleotide probe, 452–456
thyroid autoantigen cloning, 449–452, 462–466
thyroid microsomal antigen, 462–466
thyrotropin receptor, 462
Renal hypertension, and atrial natriuretic factor, 193
Renin, atrial natriuretic factor effects, 8–9, 125–129, 174–175, 216–217
second messenger role, 96
Renin-angiotensin-aldosterone system, atrial natriuretic factor effects, **123–136**

Reproductive tracts, steroid effects, 1037, 1038–1039
RNA, messenger, hybridization selection, 460

Salivary gland, and eutopic somatostatin hypersecretion, 813
Sarcoid, 632–633
Second messenger system, action of, 90
  and atrial natriuretic factor. See *Guanylate cyclase.*
Selenium analog of atrial natriuretic factor, 25–26
Sella turcica, computed tomography of, 560–561
Serotonin system, in hypothalamus, 897–898
Sex, and gonadotroph cell pituitary adenomas, 757
Sex hormones, in aging female, **1027–1043**
  age-related reproductive dysfunction, 1038–1039
  behavior, 1037–1038
  estrous cycle and age-related acyclicity, 1028–1029
  menstrual cycle and menopause, 1027–1028
  negative feedback, 1033–1036
  ovarian steroidogenesis, 1030–1032
  positive feedback, 1036
  prolactin, 1036–1037
  reproductive tract response to steroids, 1037
  in aging male, **1045–1059**
  hypothalamic-testicular axis, 1047–1052
  impotence, 1054
  sexual function, 1046–1047
  spermatogenesis, 1054–1056
  testosterone and sexual activity, 1052–1054
Signal transduction mechanisms. See *Immune system, signal transduction mechanisms.*
Smooth muscle, atrial natriuretic factor receptors, 73, 84, 86
  cyclic GMP action, 82
  effects of atrial natriuretic factor, 9–11
Sodium, dietary, and atrial natriuretic factor, 134–135, 201
  and hydrogen antiport, 928–929
Somatostatin hypersecretion, 812–813
Spermatogenesis, 1054–1056
Sphenoid sinus mucoceles, 635–636
Steroidogenesis, atrial natriuretic factor effects, 11–12, 129–131
  ovarian, 1030–1032
Stomach and intestine, and eutopic somatostatin hypersecretion, 812
Stress, and autoimmune thyroid disease, 336–337
  and glucocorticoids in aging, **965–980**
  adrenocortical function, 967–971
  pacemakers of gradual aging, 973–975
  triggers of programmed aging, 971–973
Surgery, for acromegaly, 696–697
  for Cushing's disease, 721–722
  pituitary, **647–665**
  adjunctive therapy, 662–663
  approach in, 650–660
  craniotomy, 659–660
  trans-sphenoidal, 651–659
  history of, 647–648
  indications for, 648–649
  preoperative evaluation and management, 650
  results of, 660–662
  for thyroid-associated ophthalmopathy, 400–402

T lymphocytes, in autoimmune thyroid disease, **287–326**
  antigen presentation in, 308–310
  antithyroid drug effects on cellular mechanisms, 310–312
  cell-mediated immunity in ophthalmopathy, 312–315
  and HLA-DR expression, 314–315
  T-cell dysfunction, 313–314
  cellular immunity in subacute thyroiditis, 315–316
  function of, 294–308
  helper/suppressor T lymphocyte abnormalities, 301–308
  HLA-DR expression on T-cell surfaces, 296–297
  lymphokine production, 297–300
  migration of T lymphocytes, 295
  proliferation of T lymphocytes, 295–296
  T-cell autoreactivity to nonthyroid DR antigens, 297
  phenotypic lymphocyte analysis, 288–294
  circulating lymphocyte studies, 288–292
  intrathyroidal lymphocyte studies, 292–294
  cytotoxic, in autoimmune thyroid disease, 273–275
  MHC restriction of, 275–276
  receptors immunogenetics, 229–240
Testicular function. See *Sex hormones, in aging male.*
Testosterone, atrial natriuretic factor effects, 97, 131, 175
  and sexual activity, 1052–1054

Thyroid, ablation in thyroid-associated ophthalmopathy, 400
autoimmune disease of, autoantibodies in, **343–363**
cytotoxic mechanisms in, **269–286**
antibody-dependent cell-mediated, 272
antibody-dependent complement-mediated, 271
in experimental autoimmune thyroiditis, 270–271
immune complexes in, 272
MHC restriction of T lymphocytes, 275–276
monokines and lymphokines, 276
natural killer cell-mediated, 272–273
T lymphocytes in, 273–275
environmental factors in, **327–342**
humoral immunity in, 418
immunogenetics of, **229–245**
and intrathyroidal MHC class II antigen expression, **247–268**
and pregnancy, **431–444**
and recombinant DNA technology, **445–468**
T lymphocyte role in, **287–326**
diseases, age effects, **1013–1025**
hyperthyroidism, 1020–1022
hypothyroidism, 1016–1019
lymphocytic thyroiditis, 1013–1014
multinodular goiter, nodules, and thyroid cancer, 1014–1016
and eutopic somatostatin hypersecretion, 812–813
function after subtotal thyroidectomy, 380–381
growth-stimulating IgG, 356
MHC class II antigens, 254–260
animal models, 254
antigen presentation, 261
and disease susceptibility, 263–265
gene transcription of, 254–256
HLA-DP and HLA-DQ expression, 254
in human, 254
immune amplification, 261
and initiation of autoimmune thyroid disease, 261–263
normal levels of gene expression, 256–268
variability in HLA-DR antigen expression, 258–260
Thyroid hormone, in hypothyroidism, 1017
Thyroid releasing hormone, in gonadotroph cell pituitary adenomas, 758
Thyroid-stimulating hormone, in hypothyroidism, 1017–1018
animal studies, 1019
neuroendocrinology of, 492–494
Thyroidectomy, subtotal, for Graves' disease, 378–381
complications of, 379–380
general considerations, 378–379
preparation for surgery, 379
thyroid function after, 380–381
Thyroiditis, atrophic, immunogenetics of, 241
autoimmune, cytotoxic mechanisms in, 270–271
immunogenetics of, 240
chronic, hypothyroidism in, 420
Hashimoto's, hypothyroidism in, 420
immunogenetics of, 240–241
and pregnancy, 436–437
postpartum and silent, immunogenetics of, 241
subacute, cellular immunity in, 315–316
immunogenetics of, 241–242
transient, hypothyroidism in, 420–422
Thyrotoxic crisis, in Graves' disease, 382, 383
Thyrotropin, and aging, 986–987
ectopic secretion, 814
peptide regulation of, 906–908
Thyrotropin receptor antibodies, **343–363**, 418–420
assays for, 346–349
cytochemical assays, 348
FRTL5 cell stimulation, 348
thyroid cell stimulation in monolayer cultures, 346–348
TSH-binding inhibition, 348–349
in autoimmune thyroid disease, 349–352
in euthyroid relatives of patients with Graves' disease, 351–352
Graves' disease, 349–350
nonautoimmune thyroid disorders, 350–351
and cloning of thyroid autoantigens, 462
mechanisms for production of, 357–359
multiplicity of, in autoimmune thyroid disease, 352–356
nomenclature of, 346
thyroid growth-stimulating IgG, 356
Thyrotropin-secreting pituitary tumors, **765–791**
and euthyroidism, 783
and hyperthyroidism, 772–782
clinical features, 772–773
differential diagnosis, 780–781
dynamic studies, 777–780
pathology, 780
radiographic studies, 775–777
therapy, 781–782
and hypothyroidism, 767–772
clinical features, 768–769
laboratory studies, 769–770
laboratory studies, 773–775
therapy, 770–772
thyrotropin secretion, regulation of, 765–767

TRAb. See *Thyrotropin receptor autoantibodies.*
Transphenoidal surgery, 651–659
  for prolactinomas, 739–740
Tuberculosis, differential diagnosis of, 632
Tuberculum sellae meningiomas, 576
Tuberoinfundibular system, 489–492

Urine dilution capacity in elderly, 870–872

Vascular smooth muscle, atrial natriuretic factor effects, 9–10, 131–132, 164–170
  second messenger role in, 89–92
Vascular system, adrenergic modulation of tone, 879–882
  atrial natriuretic factor receptors, 66
Vasoconstriction by atrial natriuretic factor, 10, 110
Vasodilation by atrial natriuretic factor, 9–10, 110, 114–116, 164–170
Vasodilators, and cyclic GMP, 83, 86
Vasopressin, atrial natriuretic factor effects, 152–155, 175
Vision defects, causes of, 591–605
    anterior angle of chiasm and nerve compression, 598
    compression of body of chiasm, 593–598
    posterior angle of chiasm and tract compression, 593–603
  detection of, 604
  pathophysiology of, 606–607
  patterns of, 588–590
  visual function after treatment, 605–606
Visual acuity, in thyroid-associated ophthalmopathy, 394–395
Visual system, in prolactinomas, 738
Vitamin D, calcium homeostasis and osteoporosis, 836–837
Volume overload, atrial natriuretic factor in, 201
Volume regulation by atrial natriuretic factor, 134–135

Water excretion, **867–875**
  AVP secretory capacity, 868
  osmolar clearance, 872–873
  osmoreceptor sensitivity, 868–869
  renal collecting tubule responsiveness to AVP, 869–870
  urinary diluting capacity, 870–872
Weight loss, and non-insulin-dependent diabetes mellitus, 857